

**SHARP**<sup>®</sup>

# **PN-K321**

**LCD MONITOR**

**OPERATION MANUAL**

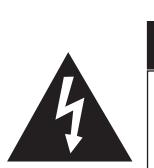


HIGH-DEFINITION MULTIMEDIA INTERFACE



# IMPORTANT INFORMATION

**WARNING:** TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.



## CAUTION

RISK OF ELECTRIC  
SHOCK  
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within a triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within a triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

# DEAR SHARP CUSTOMER

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Thank you for your purchase of a SHARP LCD product. To ensure safety and many years of trouble-free operation of your product, please read the Safety Precautions carefully before using this product.

## SAFETY PRECAUTIONS

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Electricity is used to perform many useful functions, but it can also cause personal injuries and property damage if improperly handled. This product has been engineered and manufactured with the highest priority on safety. However, improper use can result in electric shock and/or fire. In order to prevent potential danger, please observe the following instructions when installing, operating and cleaning the product. To ensure your safety and prolong the service life of your LCD product, please read the following precautions carefully before using the product.

1. Read instructions — All operating instructions must be read and understood before the product is operated.
2. Keep this manual in a safe place — These safety and operating instructions must be kept in a safe place for future reference.
3. Observe warnings — All warnings on the product and in the instructions must be observed closely.
4. Follow instructions — All operating instructions must be followed.
5. Cleaning — Unplug the power cord from the AC outlet before cleaning the product. Use a dry cloth to clean the product. Do not use liquid cleaners or aerosol cleaners.
6. Attachments — Do not use attachments not recommended by the manufacturer. Use of inadequate attachments can result in accidents.
7. Water and moisture — Do not use the product near water. Do not install the product in a place where water may splash onto it. Be careful of equipment which drains water such as an air-conditioner.
8. Ventilation — The vents and other openings in the cabinet are designed for ventilation.  
Do not cover or block these vents and openings since insufficient ventilation can cause overheating and/or shorten the life of the product. Do not place the product on a sofa, rug or other similar surface, since they can block ventilation openings.  
Do not place the product in an enclosed place such as a bookcase or rack, unless proper ventilation is provided or the manufacturer's instructions are followed.
9. Power cord protection — The power cords must be routed properly to prevent people from stepping on them or objects from resting on them.
10. The LCD panel used in this product is made of glass. Therefore, it can break when the product is dropped or applied with impact. Be careful not to be injured by broken glass pieces in case the LCD panel breaks.
11. Overloading — Do not overload AC outlets or extension cords. Overloading can cause fire or electric shock.
12. Entering of objects and liquids — Never insert an object into the product through vents or openings. High voltage flows in the product, and inserting an object can cause electric shock and/or short internal parts.  
For the same reason, do not spill water or liquid on the product.
13. Servicing — Do not attempt to service the product yourself. Removing covers can expose you to high voltage and other dangerous conditions. Request a qualified service person to perform servicing.
14. Repair — If any of the following conditions occurs, unplug the power cord from the AC outlet, and request a qualified service person to perform repairs.
  - a. When the power cord or plug is damaged.
  - b. When a liquid was spilled on the product or when objects have fallen into the product.
  - c. When the product has been exposed to rain or water.
  - d. When the product does not operate properly as described in the operating instructions.  
Do not touch the controls other than those described in the operating instructions. Improper adjustment of controls not described in the instructions can cause damage, which often requires extensive adjustment work by a qualified technician.
  - e. When the product has been dropped or damaged.
  - f. When the product displays an abnormal condition. Any noticeable abnormality in the product indicates that the product needs servicing.
15. Replacement parts — In case the product needs replacement parts, make sure that the service person uses replacement parts specified by the manufacturer, or those with the same characteristics and performance as the original parts. Use of unauthorized parts can result in fire, electric shock and/or other danger.
16. Safety checks — Upon completion of service or repair work, request the service technician to perform safety checks to ensure that the product is in proper operating condition.
17. Wall mounting — When mounting the product on a wall, be sure to install the product according to the method recommended by the manufacturer.
18. Heat sources — Keep the product away from heat sources such as radiators, heaters, stoves and other heat-generating products (including amplifiers).
19. Usage of the monitor must not be accompanied by fatal risks or dangers that could lead directly to death, personal injury, severe physical damage or other loss, including nuclear reaction control in nuclear facility, medical life support system, and missile launch control in a weapon system.
20. Do not stay in contact with the parts of the product that become hot for long periods of time. Doing so may result in low-temperature burns.

# SAFETY PRECAUTIONS (Continued)

## WARNING:

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate counter measures.

To maintain compliance with EMC regulations, use shielded cables to connect to the following terminals: HDMI input terminal and DisplayPort input terminal.

If a monitor is not positioned in a sufficiently stable location, it can be potentially hazardous due to falling. Many injuries, particularly to children, can be avoided by taking simple precautions such as:

- Using fixing devices like wall mount brackets recommended by the manufacturer.
- Only using furniture that can safely support the monitor.
- Ensuring the monitor is not overhanging the edge of the supporting furniture.
- Not placing the monitor on tall furniture (for example, cupboards or bookcases) without anchoring both the furniture and the monitor to a suitable support.
- Not standing the monitors on cloth or other materials placed between the monitor and supporting furniture.
- Educating children about the dangers of climbing on furniture to reach the monitor or its controls.

## Especially for child safety

- Don't allow children to climb on or play with the monitor.
- Don't place the monitor on furniture that can easily be used as steps, such as a chest of drawers.
- Remember that children can become excited while watching a program, especially on a "larger than life" monitor. Care should be taken to place or install the monitor where it cannot be pushed, pulled over, or knocked down.
- Care should be taken to route all cords and cables connected to the monitor so that they cannot be pulled or grabbed by curious children.

# TIPS AND SAFETY INSTRUCTIONS

- The TFT color LCD panel used in this monitor is made with the application of high precision technology. However, there may be minute points on the screen where pixels never light or are permanently lit. Also, if the screen is viewed from an acute angle there may be uneven colors or brightness. Please note that these are not malfunctions but common phenomena of LCDs and will not affect the performance of the monitor.
- Do not display the same image for an extended time. Displaying the same image for an extended time may cause a residual image. In particular, an image with strong contrast may cause a residual image after several hours.
- Never rub or tap the monitor with hard objects.
- Please understand that SHARP CORPORATION bears no responsibility for errors made during use by the customer or a third party, nor for any other malfunctions or damage to this product arising during use, except where indemnity liability is recognized under law.
- This monitor and its accessories may be upgraded without advance notice.
- Do not use the monitor where there is a lot of dust, where humidity is high, or where the monitor may come into contact with oil or steam, as this could lead to fire.
- Ensure that the monitor does not come into contact with water or other fluids. Ensure that no objects such as paper clips or pins enter the monitor as this could lead to fire or electric shock.
- Do not place the monitor on top of unstable objects or in unsafe places. Do not allow the monitor to receive strong shocks or to strongly vibrate. Causing the monitor to fall or topple over may damage it.
- Do not use the monitor near heating equipment or in places where there is likelihood of high temperature, as this may lead to generation of excessive heat and outbreak of fire.
- Do not use the monitor in places where it may be exposed to direct sunlight.
- Images cannot be rotated on this monitor.  
When using in portrait orientation, you will need to prepare appropriately orientated content in advance.
- The AC outlet shall be installed near the equipment and shall be easily accessible.

## The Power Cord and AC adapter

- Use only the power cord and AC adapter supplied with the monitor.
- When handling the AC adapter, observe the following: Incorrect handling may result in fire, electric shock, or injury.
  - Do not drop the AC adapter or subject it to impact.
  - Never disassemble the AC adapter. It contains high voltage parts that are dangerous to touch.
  - The AC adapter is for indoor use only. Do not use it outside.
  - Do not use the supplied AC adapter with other devices.
- Do not damage the power cord and AC adapter nor place heavy objects on it, stretch it or over bend it. Also, do not add extension cords. Damage to the cord may result in fire or electric shock.
- Do not use the power cord with a power tap. Adding an extension cord may lead to fire as a result of overheating.
- Do not remove or insert the power plug with wet hands. Doing so could result in electric shock.
- Unplug the power cord if it is not used for a long time.
- Do not attempt to repair the power cord if it is broken or malfunctioning. Refer the servicing to the service representative.
- Do not stay in contact with the parts of the product and the AC adapter that become hot for long periods of time. Doing so may result in low-temperature burns.
- Do not fasten the AC adapter to the monitor or other equipment. Doing so may result in fire and electrical shock.

## Manual Scope

- Microsoft, Windows and Internet Explorer are registered trademarks of Microsoft Corporation.
- The terms HDMI and HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.
- DisplayPort is a registered trademark of Video Electronics Standards Association.
- Adobe, Acrobat, and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.
- This product comes with RICOH Bitmap Fonts produced and sold by RICOH COMPANY, LTD.
- All other brand and product names are trademarks or registered trademarks of their respective holders.
- Language of OSD menu used in this manual is English by way of example.
- Illustrations in this manual may not exactly represent the actual product or display.
- This manual assumes use in landscape orientation, except where specifically noted.

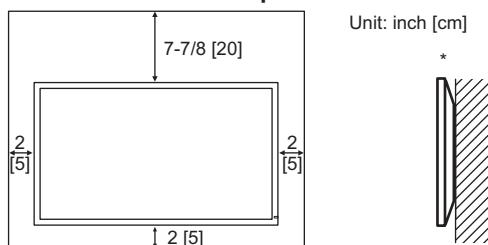
## LED Backlight

- The LED backlight in this product has a limited lifetime.
  - \* If the screen gets dark or does not turn on, it may be necessary to replace the LED backlight. This LED backlight is exclusive to this product and must be replaced by an authorized SHARP servicing dealer or service center.
  - \* Please contact your local SHARP servicing dealer or service center for assistance.

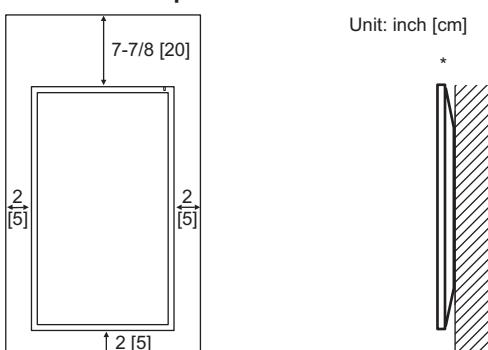
# MOUNTING PRECAUTIONS

- This product is for use indoors.
- A mounting bracket compliant with VESA specifications is required.
- To install on a stand (commercially available) or on a wall, or to remove or move the monitor, consult your dealer.
- Mounting the monitor on the wall requires special expertise and the work must be performed by an authorized SHARP dealer. You should never attempt to perform any of this work yourself. Our company will bear no responsibility for accidents or injuries caused by improper mounting or mishandling.
- Use the monitor with the surface perpendicular to a level surface. If necessary, the monitor may be tilted up to 25 degrees upward or 20 degrees downward.
- This monitor should be used at an ambient temperature between 32°F (0°C) and 104°F (40°C). Provide enough space around the monitor to prevent heat from accumulating inside.

## For the monitor in landscape orientation

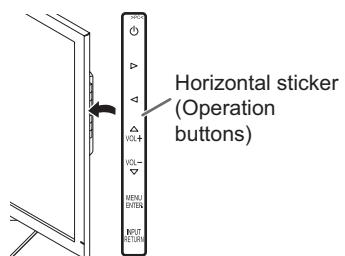


## For the monitor in portrait orientation



- \* When you install this monitor on a wall, the monitor emits heat during operation, please be aware that this heat may discolor or alter the wall.
- If it is difficult to provide sufficient space for any reason such as the installation of the monitor inside a housing, or if the ambient temperature may be outside of the range of 32°F (0°C) to 104°F (40°C), install a fan or take other measures to keep the ambient temperature within the required range.
- Do not block any ventilation openings. If the temperature inside the monitor rises, this could lead to a malfunction.
- Do not place the monitor on a device which generates heat.

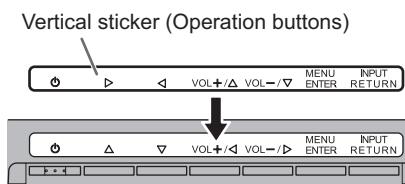
- When installing the monitor in landscape orientation, you can attach the supplied horizontal sticker (Operation buttons) to the right side.



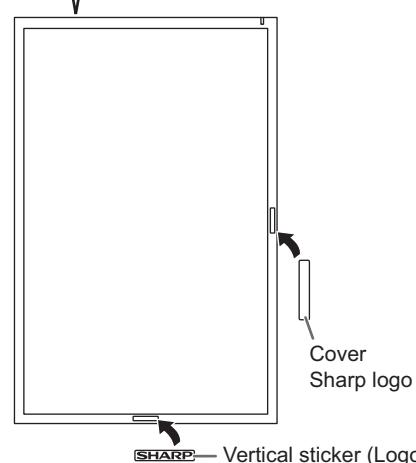
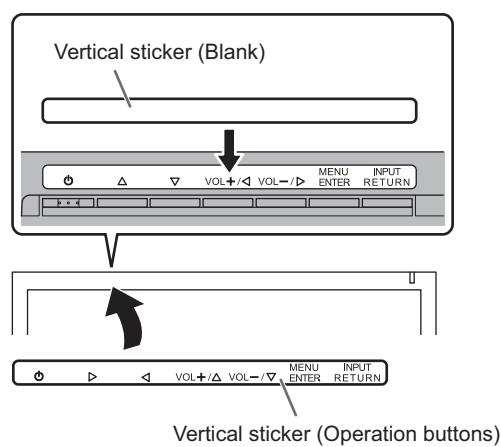
- Use the supplied vertical sticker when you install the monitor in portrait orientation.

Attach the vertical sticker (Operation buttons) to the back or the front.

### • Back



### • Front



# Contents

<b>IMPORTANT INFORMATION.....</b>	<b>3</b>	<b>Menu Items .....</b>	<b>18</b>
DEAR SHARP CUSTOMER.....	4	Displaying the menu screen.....	18
<b>SAFETY PRECAUTIONS.....</b>	<b>4</b>	Menu item details .....	19
<b>TIPS AND SAFETY INSTRUCTIONS .....</b>	<b>6</b>	<b>Initialization (Reset)/Functional Restriction Setting (FUNCTION).....</b>	<b>23</b>
<b>MOUNTING PRECAUTIONS .....</b>	<b>7</b>	<b>Controlling the Monitor with a PC (RS-232C).....</b>	<b>24</b>
<b>Supplied Components.....</b>	<b>8</b>	PC connection .....	24
<b>Part Names .....</b>	<b>9</b>	Communication conditions .....	24
<b>Installing the stand (supplied).....</b>	<b>10</b>	Communication procedure .....	24
<b>Connecting Peripheral Equipment.....</b>	<b>12</b>	RS-232C command table.....	26
Connection with a PC or AV equipment .....	12	<b>Troubleshooting.....</b>	<b>30</b>
<b>Connecting the Power Cord .....</b>	<b>13</b>	<b>Specifications .....</b>	<b>31</b>
<b>Binding Cables.....</b>	<b>14</b>	<b>Mounting Precautions (For SHARP dealers and service engineers).....</b>	<b>36</b>
<b>Turning Power On/Off.....</b>	<b>15</b>		
Turning on the main power.....	15		
Turning power on/off .....	15		
<b>Basic Operation .....</b>	<b>16</b>		

## Supplied Components

If any component should be missing, please contact your dealer.

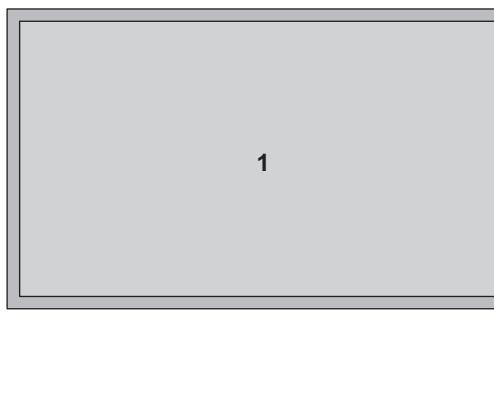
- Liquid Crystal Display Monitor: 1
- Power cord: 1
- AC adapter: 1
- CD-ROM (Utility Disk for Windows): 1
- Setup Manual: 1
- DisplayPort cable: 1
- RS-232C conversion cable (Φ3.5 mini-jack): 1
- Pedestal (for stand): 1
- Strut (for stand): 1
- Attachment plate (for stand): 1 (preinstalled on monitor)
- Countersunk screws (M4 x 6 without washers): 5
- Screws (M4 x 10 with washers): 4
- Hex wrench: 1
- Cable clamp: 2
- Cable clamp (small): 1
- Cable clamp (large): 2
- Vertical sticker (Logo): 1
- Vertical sticker (Operation buttons): 1
- Vertical sticker (Blank): 1
- Horizontal sticker (Operation buttons): 1
- Cover Sharp logo: 1

Place this sticker onto the SHARP logo to cover the logo.

\* Sharp Corporation holds authorship rights to the Utility Disk program. Do not reproduce it without permission.

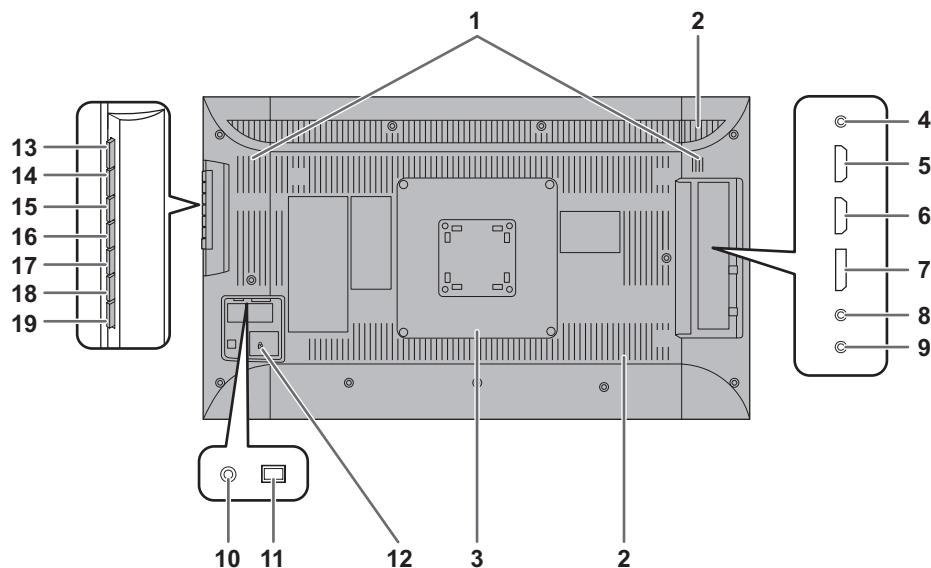
# Part Names

## ■Front view



1. LCD panel
2. Power LED (See page 15.)

## ■Rear view



1. Speakers
2. Vents
3. Attachment plate (for stand)
4. RS-232C input terminal (See page 12.)
5. PC/AV HDMI 1 input terminal (See page 12.)
6. PC/AV HDMI 2 input terminal (See page 12.)
7. DisplayPort input terminal (See page 12.)
8. Audio input terminal (See page 12.)
9. Headphone terminal (See page 12.)
10. AC input terminal (See page 13.)
11. Main power switch (See page 15.)
12. Antitheft hole (¶)
13. Power button (⊕) (See page 16.)
14. Brightness adjustment button (△) (See page 16.)
15. Brightness adjustment button (▽) (See page 16.)
16. [VOL+/-] button (See page 16.)
17. [VOL-/+] button (See page 16.)
18. [MENU/ENTER] button (See page 16.)
19. [INPUT/RETURN] button (See page 16.)

# Installing the stand (supplied)

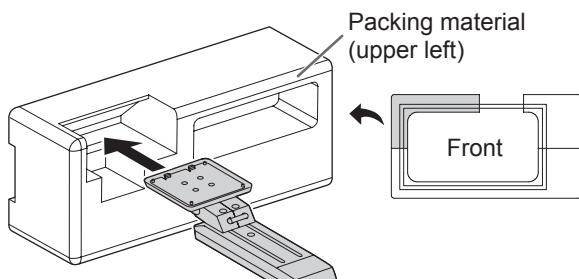
## !Caution

- Disconnect all cables from the monitor.
- Firmly tighten the installation screws (supplied) with the hex wrench (supplied).
- Ensure that you have sufficient space to work.

## ■Attaching the stand

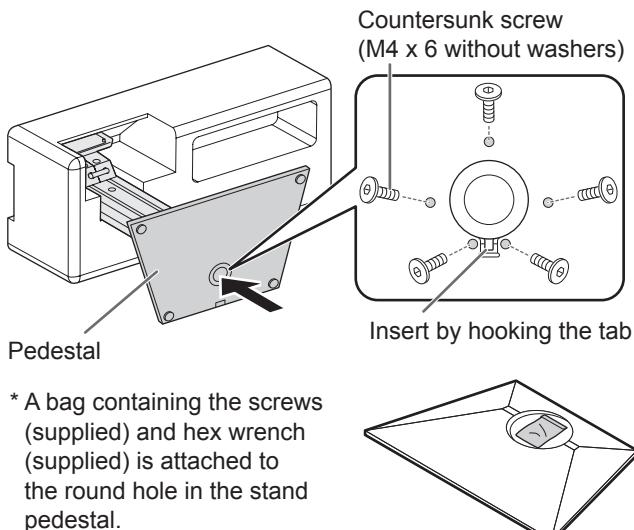
Remove all packaging materials before starting work.  
To prevent the table (etc.) from being damaged by the stand pedestal, spread a thick, soft cloth (blanket, etc.) and work on the cloth.

### 1. Insert the stand strut into the packaging material (upper left) as shown.



### 2. While supporting the stand pedestal with your hand, fasten to the stand strut with the supplied countersunk screws (M4 x 6 without washers) (x5).

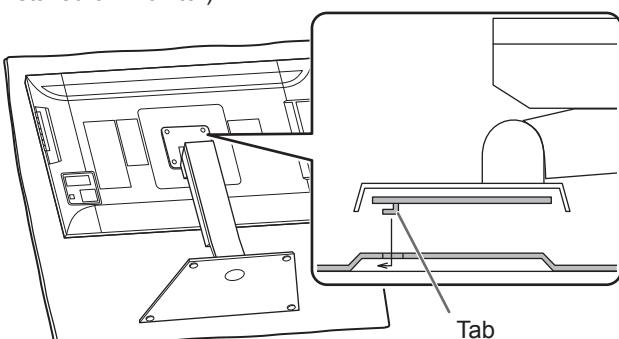
Use the supplied hex wrench.



### 3. Spread a thick, soft cloth (blanket, etc.) that will prevent damage to the LCD panel on a stable flat surface where the entire monitor can be placed, and place the monitor with the LCD panel face down on the cloth.

### 4. Place the stand on the monitor.

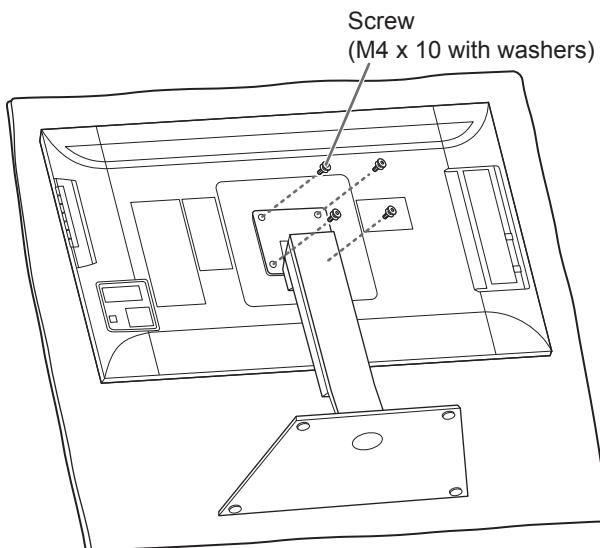
Hook the tab on the stand under the mounting plate (pre-installed on monitor).



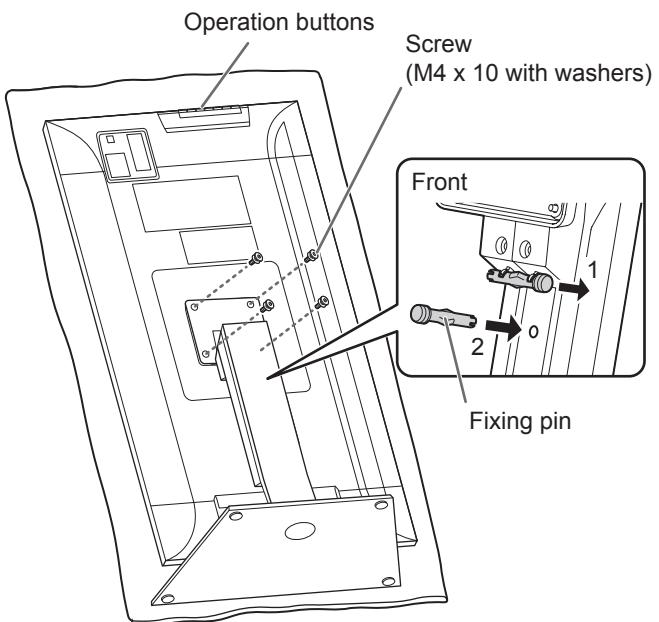
### 5. Fasten the stand to the monitor with the supplied screws (M4 x 10 with washers) (x4).

Use the supplied hex wrench.

#### • Landscape



#### • Portrait



\* If the monitor will be used in the portrait orientation, pull out the fixing pin (1), and insert it into the hole (2) as shown above.

\* To remove the stand, place the monitor and stand as shown above and remove the screws.

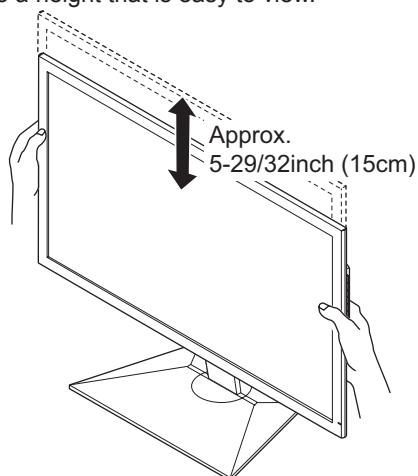
## !Caution

- Adhere to the following when installing the monitor in its portrait orientation. Failing to adhere to the following may cause malfunctions.
  - Install the monitor such that the operation buttons are located on the top side.
  - Set the MONITOR on the MONITOR menu to PORTRAIT. (See page 20.)

## ■ Height/angle adjustment

### • Adjusting the height

Adjust to a height that is easy to view.

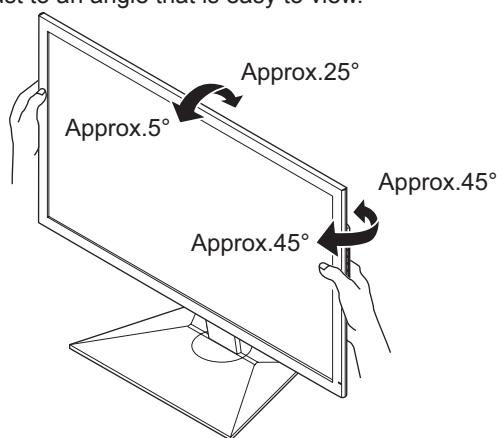


### TIPS

- The height cannot be adjusted in a vertical installation.

### • Adjusting the angle

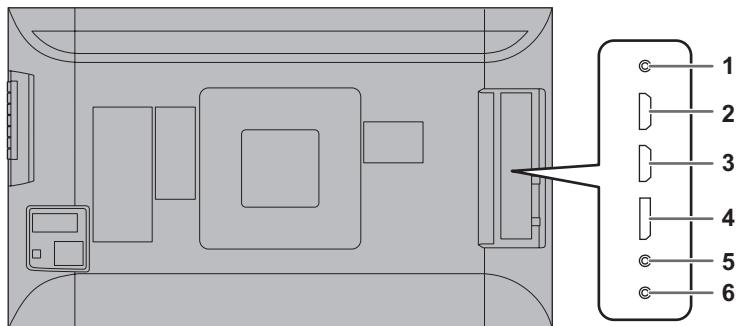
Adjust to an angle that is easy to view.



### ! Caution

- When moving the monitor, be sure to grasp only the frame. Grasping and applying pressure to the LCD panel may damage it.
- Take care not to pinch your fingers.
- If you are installing the monitor in landscape orientation, take caution when adjusting the angle at a raised height, so that it does not topple.

# Connecting Peripheral Equipment



## !Caution

- Be sure to turn off the main power switch and disconnect the plug from the power outlet before connecting/disconnecting cables. Also, read the manual of the equipment to be connected.
- Be careful not to confuse the input terminal with the output terminal when connecting cables. Accidentally reversing cables connected to the input and output terminals may cause malfunctions and the other problems.
- Do not use any cable that has a damaged or deformed terminal. Using such a cable may cause malfunctions.
- Images may not be displayed properly depending on the computer (video cards), cables, or peripheral devices to be connected.

## TIPS

- The audio input terminals used in each input mode are factory-set as follows.

Input mode	Audio input terminal (Factory setting)
DisplayPort	DisplayPort input terminal
HDMI1 [PC], HDMI1 [AV] HDMI2 [PC], HDMI2 [AV]	PC/AV HDMI input terminal

## Connection with a PC or AV equipment

### 1. RS-232C input terminal

- The monitor can be connected to a PC using the RS-232C conversion cable (supplied) and a commercially available RS-232 straight cable to control the monitor from the PC.

### 2. PC/AV HDMI1 input terminal

### 3. PC/AV HDMI2 input terminal

- Use a commercially available HDMI cable (High Speed cable compliant).
- Set HDMI1, HDMI2, or HDMI DUAL in INPUT SELECT on the SETUP menu according to the device to be connected.
- Select the audio input terminal to be used in HDMI1 [AV], HDMI1 [PC], HDMI2 [AV], or HDMI2 [PC] of AUDIO SELECT on the SETUP menu.

When HDMI1 or HDMI2 is selected, connection to the audio input terminal is unnecessary.

### 4. DisplayPort input terminal

- Use the supplied DisplayPort cable.
- Select the audio input terminal to be used in DisplayPort of AUDIO SELECT on the SETUP menu.  
When DisplayPort is selected, connection to the audio input terminal is unnecessary.

\* Use the supplied cable.

\* If you need to extend the cable, consult your dealer.

### 5. Audio input terminal

- Use a commercially available audio cable (mini stereo jack) without resistance.
- Set the audio input terminal used for each input mode in AUDIO SELECT on the SETUP menu.

### 6. Headphone terminal

- Use commercially available headphones (mini stereo jack).
- The output sound varies depending on the input mode.
- The volume can be adjusted using the volume adjustment.

## TIPS

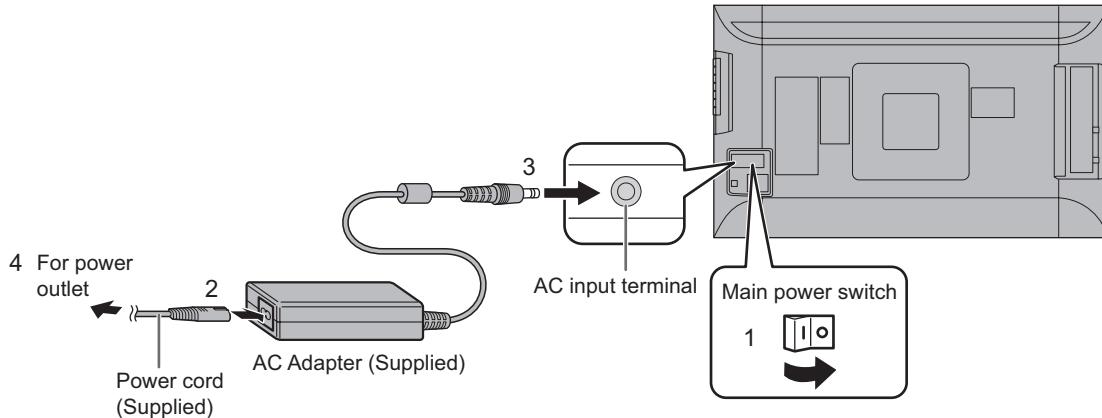
- The length of the signal cables or surrounding environment may affect the image quality.
- Video output is disabled in the following cases:  
When the power is turned off  
When the monitor is in input signal waiting mode

# Connecting the Power Cord

## !Caution

- Use only the power cord and AC adapter supplied with the monitor.

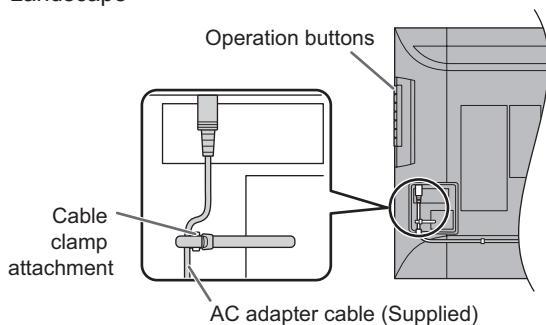
1. Turn off the main power switch.
2. Connect the AC adapter (supplied) to the power cord (supplied).
3. Connect the AC adapter (supplied) to the AC input terminal.
4. Plug of the power cord (supplied) into the AC power outlet.



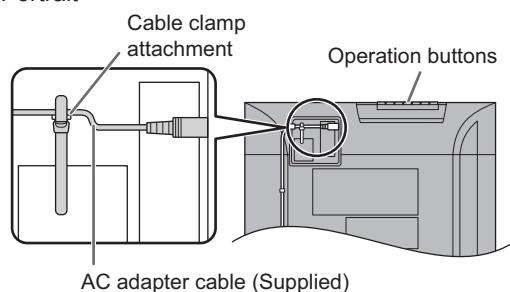
## TIPS

- Be sure to clamp the AC adapter cable (supplied) onto the cable clamp attachment using the supplied cable clamp. When clamping the AC adapter cable, take care not to stress the terminal of the AC adapter cable. Do not bend the AC adapter cable excessively.

### • Landscape



### • Portrait



## !Caution

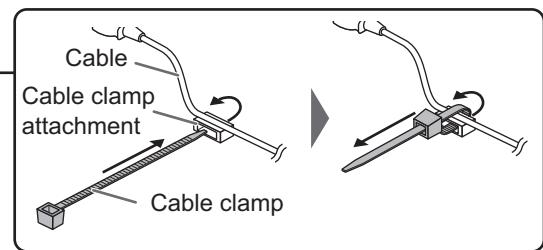
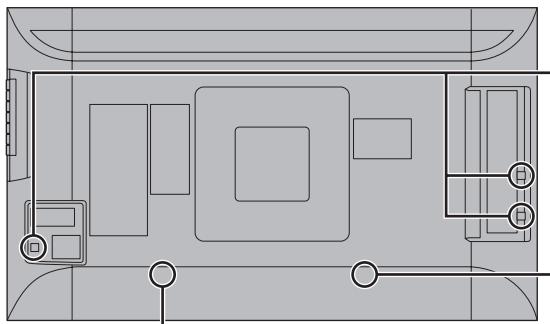
- Do not fasten the supplied AC adapter to the monitor or other equipment.

# Binding Cables

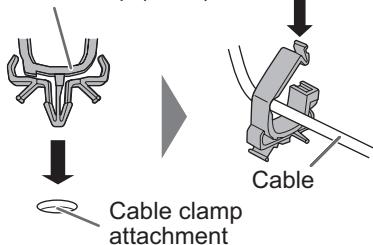
## ■Fastening the cables

The cables connected to the terminals on the rear of the monitor can be fastened with the cable clamp.

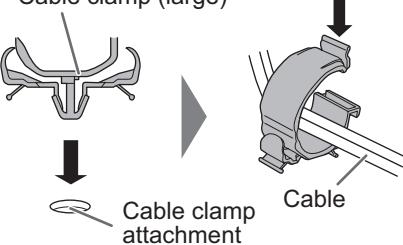
Attach the cable clamps to the attachment parts on the back of the monitor and the stand, and bind the cables.



Cable clamp (small)



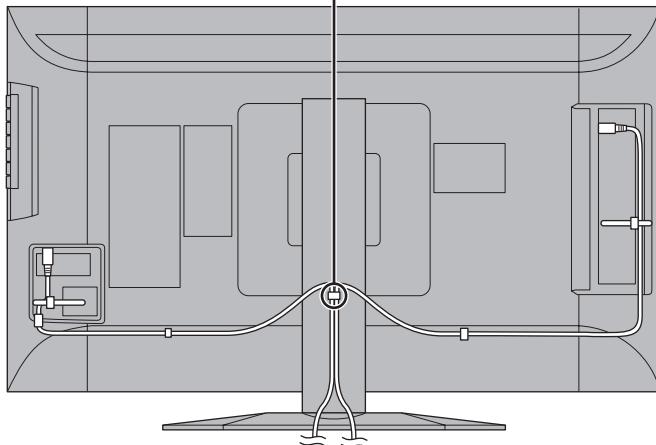
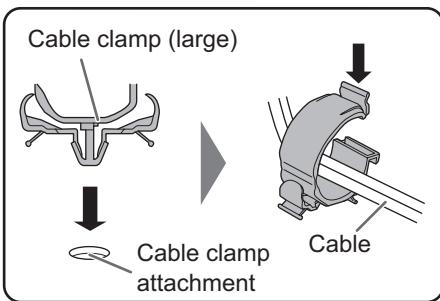
Cable clamp (large)



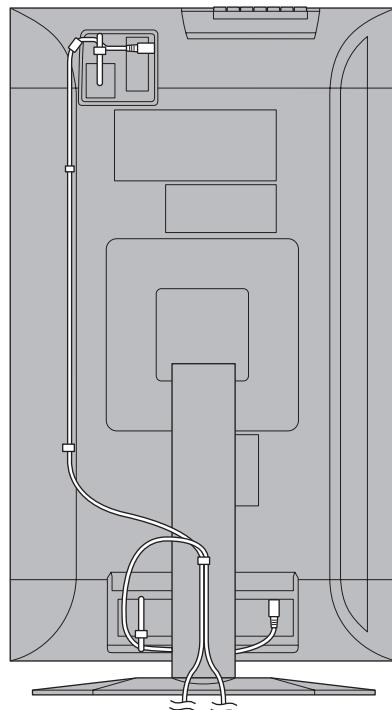
## ■Storing the cables

The cables connected to the rear of the monitor can be bound using the cable clamp on the stand.

- Landscape



- Portrait



### ! Caution

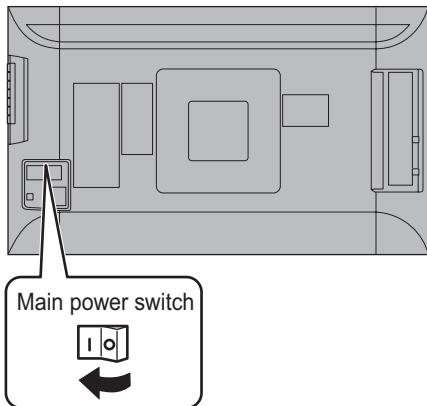
- Do not forcibly bend or apply force to the cables. Risk of wire breakage or other damage.

# Turning Power On/Off

## !Caution

- Turn on the monitor first before turning on the PC or playback device.

## Turning on the main power



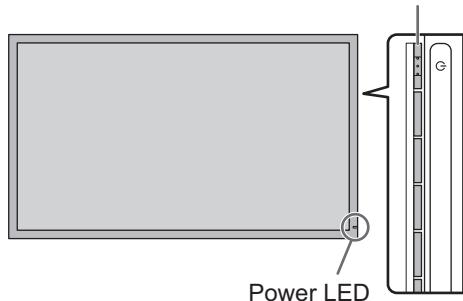
## !Caution

- The main power must be turned on/off with the main power switch. Do not connect/disconnect the power cord or turn the breaker on/off while the main power switch is on.
- When switching the main power switch or the power button (⊕) off and back on, always wait for at least 5 seconds.
- For a complete electrical disconnection, pull out the main plug.

## Turning power on/off

Press the power button (⊕) to turn the power ON/OFF.

Power button (⊕)



Power lamp status	Status of the monitor
Green lit	Power on
Off	Power off (Standby mode)
Orange lit	Input signal waiting mode

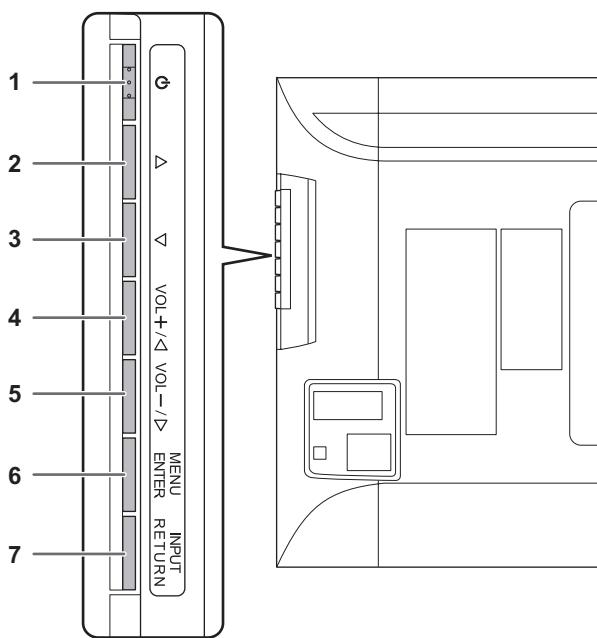
## !Caution

- When switching the main power switch or the power button (⊕) off and back on, always wait for at least 5 seconds. A short interval may result in a malfunction.

## TIPS

- When the main power switch is off, the monitor cannot be turned on.
- If the monitor is in the input signal standby mode and you press the power button (⊕), the monitor enters standby mode.

# Basic Operation



## 1. Power button (○)

Press this button to turn the power ON/OFF.

## 2,3. Brightness adjustment button (△ / ▽)

The brightness menu appears.



Adjust the brightness with the brightness adjustment button (△ / ▽).

\* If you do not press any buttons for about 4 seconds, the BRIGHT menu automatically disappears.

Move the cursor left or right in the menu screen, and increase or decrease the setting.

\* The cursor moves right when the brightness adjustment button (△) is pressed, and left when the brightness adjustment button (▽) is pressed.

## 4,5. [VOL+/<]/[VOL-/>] button

The volume menu appears.



Adjust the volume with the [VOL+/<]/[VOL-/>] buttons.

\* If you do not press any buttons for about 4 seconds, the VOLUME menu automatically disappears.

Move the cursor up or down in the menu screen, and increase or decrease the setting.

\* The cursor moves up when the [VOL+/<] button is pressed, and down when the [VOL-/>] button is pressed.

## 6. [MENU/ENTER] button

Displays and turns off the menu screen. (See page 18.)  
Settings can be entered when the menu screen is displayed.

## 7. [INPUT/RETURN] button

The input selection menu is displayed.

Press the [VOL+/<]/[VOL-/>] buttons to select the input mode, and press [INPUT/RETURN] button to enter.

Input mode	Video	Audio
DisplayPort	DisplayPort input terminal	*3
HDMI1 [PC]	PC/AV HDMI input terminal <sup>*1</sup>	
HDMI1 [AV]		
HDMI2 [PC]	PC/AV HDMI input terminal <sup>*2</sup>	
HDMI2 [AV]		

## When HDMI DUAL is set to ON

Input mode	Video	Audio
DisplayPort	DisplayPort input terminal	*3
HDMI DUAL [PC] <sup>*4</sup>	PC/AV HDMI input terminal <sup>*4</sup>	
HDMI DUAL [AV] <sup>*4</sup>		*5

\*1 Select the terminal to be used in HDMI1 of INPUT SELECT. (See page 20.)

\*2 Select the terminal to be used in HDMI2 of INPUT SELECT. (See page 20.)

\*3 Select the terminal for AUDIO SELECT which is used for audio input. (See page 20.)

\*4 Same as the HDMI1 terminal setting.

\*5 Same as the AUDIO SELECT of HDMI1.

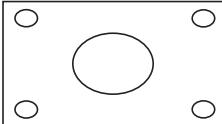
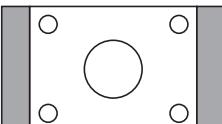
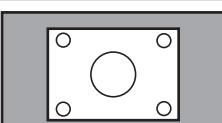
In a menu screen, returns the cursor to the previous screen.

## TIPS

- If you are using the vertical sticker (Operation buttons), substitute the following for the button displays.
  - Brightness adjustment button (△ / ▽)  
→ Brightness adjustment button (▷ / ◁)
  - [VOL+/<]/[VOL-/>] button  
→ [VOL+/<△]/[VOL-/▽] button
- If you are using the horizontal sticker (Operation buttons), substitute the following for the button displays.
  - Brightness adjustment button (△ / ▽)  
→ Brightness adjustment button (▷ / ◁)
  - [VOL+/<]/[VOL-/>] button  
→ [<△/VOL+]/[VOL-/▽] button

## ■Switching the screen size

Even when the screen size is changed, the display may remain the same depending on the input signal.

<b>WIDE</b>		PC input	Displays image so it fills the entire screen.
		AV input	An image with a 4:3 aspect ratio is stretched to fill the entire screen.
<b>NORMAL</b>		PC input	Displays image so it fills the screen without changing the aspect ratio of the input signals.
		AV input	Displays the entire image of the aspect ratio of 4:3 without changing the aspect ratio.
<b>Dot by Dot</b>		PC input	Displays the dots of the signals input from the connected PC as the corresponding dots on the screen.
		AV input	Displays at the number of panel pixels of the resolution of the input signal.

### TIPS

- Using this monitor's screen-size switching or dual-screen display functions to compress or expand the screen for commercial or public viewing in establishments like cafes or hotels may infringe on the rights of the creators, as protected by Copyright Law, so please be careful.
- When PbyP mode is set to ON, the screen size cannot be changed.
- The appearance of the original video may change if you select a screen size with a different aspect ratio than the original image (e.g. TV broadcast or video input from external equipment).
- When a non-wide image (4:3) is viewed with the whole screen using the screen-size switching function of this monitor, the edge of the image may be lost or appear distorted. If you wish to respect the creator's intentions, set the screen size to "NORMAL".
- When playing commercial software, parts of the image (like subtitles) may be cropped. In this case select the optimal screen size using the screen-size switching function of this monitor. With some software, there may be noise or distortion at the edges of the screen. This is due to the characteristics of the software, and is not a malfunction.
- Depending on the original image size, black bands may remain at the edges of the screen.

# Menu Items

## Displaying the menu screen

Video adjustment and settings of various functions are enabled. This section describes how to use the menu items. See pages 19 to 21 for details of each menu items.

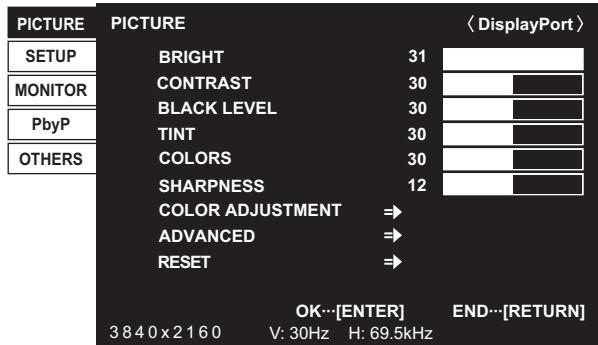
### Caution

- Do not turn the main power switch off while the menu items are being displayed. Doing so may initialize the settings.

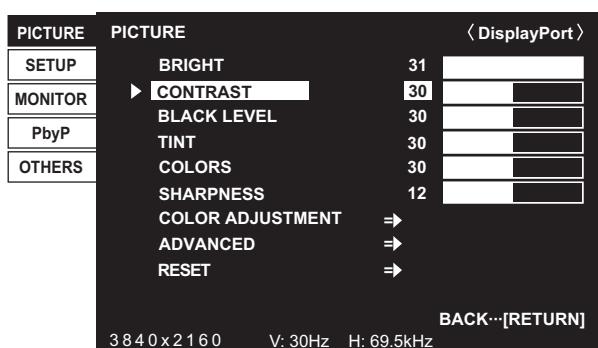
## ■Example of operation

(Adjusting CONTRAST in the PICTURE menu)

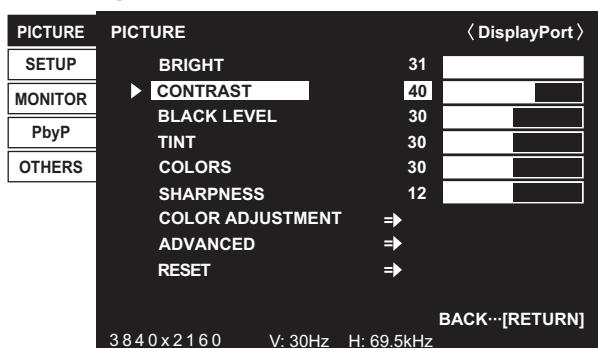
- Press [MENU/ENTER] button to display the menu screen.



- Press [VOL+/-◀]/[VOL-/-▶] button to select PICTURE, and press [MENU/ENTER] button.
- Press [VOL+/-◀]/[VOL-/-▶] button to select CONTRAST.



- Press brightness adjustment button (△ / ▽) to adjust the setting.



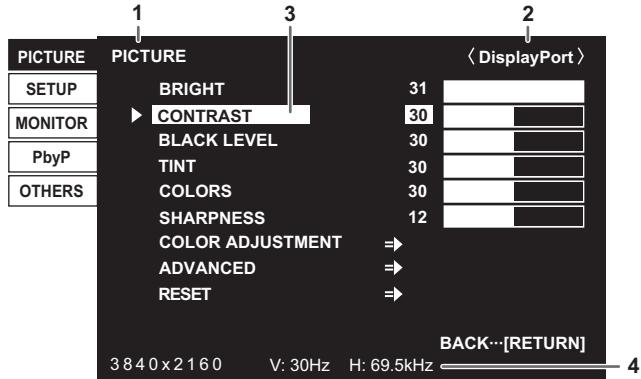
For items that have , press [MENU/ENTER] button and then configure the settings.

- Press [INPUT/RETURN] button to close the menu screen.

### TIPS

- The menu will differ depending on the input mode.
- The menu screen will close automatically if no operation is performed for about 15 seconds.

## ■Menu screen display



- Name of the menu
- Input mode
- An item being selected (highlighted)
- Screen resolution of input signal, and other data.

### TIPS

- Items that cannot be selected appear in gray. (e.g. Function not supported by the current input signal)
- The menu screen is on the left side of the screen in the landscape orientation, and at the bottom of the screen in the portrait orientation.

## Menu item details

The menu will differ depending on the input mode.

### ■PICTURE

#### BRIGHT

Adjusts the backlight brightness.

#### CONTRAST

Adjusts the difference between the bright and dark portions of the image.

#### BLACK LEVEL

Adjusts the entire brightness of the video signals.

#### TINT

Adjusts the hue. Selecting + changes the color towards green, and selecting - changes it towards magenta.

#### COLORS

Adjusts the color intensity.

#### SHARPNESS

Adjusts the sharpness of the image. Some settings and images may cause vertical lines to appear in the center of the screen.

#### COLOR ADJUSTMENT

##### COLOR MODE

The color mode changes in the following order:

STD (Standard) → VIVID → sRGB → STD...

\* sRGB applies to PC input only.

sRGB is international standard of color representation specified by IEC (International Electrotechnical Commission). Color conversion is made in taking account of liquid crystal's characteristics and represents color tone close to its original image.

#### WHITE BALANCE

THRU ..... Displays the input signal level as is. (for PC input only)

PRESET..... Selects the color temperature using PRESET.

USER ..... Used for adjusting R-/G-/B-CONTRAST and R-/G-/B-OFFSET respectively.

#### PRESET

Selects the color temperature when the WHITE BALANCE is set to PRESET.

The setting values are shown for reference. The color temperature of the screen varies over time.

This function is not intended to keep the color temperature constant.

#### USER

Adjusts each item when the WHITE BALANCE is set to USER.

R-CONTRAST..... Adjusts bright-toned red component.

G-CONTRAST .... Adjusts bright-toned green component.

B-CONTRAST..... Adjusts bright-toned blue component.

R-OFFSET ..... Adjusts dark-toned red component.

G-OFFSET ..... Adjusts dark-toned green component.

B-OFFSET ..... Adjusts dark-toned blue component.

#### COPY TO USER

Copies the value of white set for PRESET to the USER setting.

Select "ON" and then press [MENU/ENTER] button.

(In the case other than white, color tone may differ from the PRESET.)

#### GAMMA

Selects the gamma.

#### C.M.S.-HUE (AV input)

Adjusts color tone with 6 colors of R (red), Y (yellow), G (green), C (cyan), B (blue), and M (magenta).

#### C.M.S.-SATURATION (AV input)

Adjusts color vividness with 6 colors of R (red), Y (yellow), G (green), C (cyan), B (blue), and M (magenta).

#### C.M.S.-VALUE (AV input)

Adjusts color brightness with 6 colors of R (red), Y (yellow), G (green), C (cyan), B (blue), and M (magenta).

#### ADVANCED

#### RGB INPUT RANGE

Sets the RGB input signal range. To set automatically, select AUTO. Use AUTO normally.

If the RGB input signal range cannot be set appropriately even when using AUTO, set according to the image. When the setting is different, images will be displayed with washed out blacks and compressed gradients.

#### RESET

Resets the values of the PICTURE menu items to the factory preset values.

Select "ON" and then press [MENU/ENTER] button.

## Menu Items

### ■SETUP

#### LANGUAGE

Sets the display language for the menu screen.

#### INPUT SELECT

##### HDMI1/HDMI2

Select the input modes to be used for the PC/AV HDMI1 and HDMI2 input terminals.

##### HDMI DUAL

To use HDMI DUAL, select ON.

#### AUDIO SELECT

Selects the terminal used to input audio signals in each input mode.

When HDMI DUAL is used, the HDMI1 settings are applied.

#### AUDIO INPUT LEVEL

Selects the maximum audio input level of the audio input terminal.

#### BAUD RATE

Selects the communication speed used for RS-232C communication.

#### DisplayPort STREAM

When using a screen resolution of 3840 x 2160 (50Hz/60Hz) in the DisplayPort input terminal, select MST (Multi-stream).

Images may not be displayed properly with some video card combinations.

### ■MONITOR

#### MONITOR

Select the installation direction of the monitor.

LANDSCAPE .....Landscape orientation

PORTRAIT .....Portrait orientation

If the monitor is in a portrait orientation and a Windows PC is connected, set "Orientation" to "Portrait (Flipped)" in the "Screen Resolution" settings.

If you are using a different operating system, refer to the manual for your operating system.

#### OFF IF NO OPERATION

Determines whether or not to set the monitor go into standby mode when no monitor button or RS-232C command operations are performed for over 4 hours.

### ■PbyP

#### PbyP MODE

Sets the display method.

OFF .....Displays one screen.

ON .....Displays a main screen and a sub screen in a line.

\* When using PbyP mode, set HDMI DUAL to OFF and DisplayPort STREAM to SST (Single Stream).

#### PbyP SOURCE

Select the input signal of the sub-screen in PbyP mode.

When the input mode is DisplayPort ..... HDMI1 or HDMI2

When the input mode is HDMI1..... DisplayPort or HDMI2

When the input mode is HDMI2..... DisplayPort or HDMI1

## ■ OTHERS

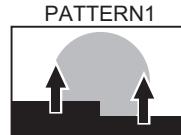
### SCREEN MOTION

#### PATTERN

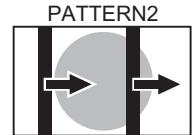
Residual images are reduced by moving the screen.

OFF ..... SCREEN MOTION function is disabled.

PATTERN1 ..... A black screen spreads from the bottom of the screen and then shrinks to the bottom of the screen. If the monitor is installed in the portrait orientation, a black screen spreads from the left end of the screen and then shrinks to the left end of the screen.



PATTERN2 ..... A black bar moves from the left end to the right end of the screen. If the monitor is installed in the portrait orientation, a black bar moves from the top to the bottom of the screen.



#### MOTION TIME 1

Specify a time period (operating interval) until SCREEN MOTION starts.

#### MOTION TIME 2

Specify a time period during which SCREEN MOTION operates (time period during which the screen will move).

### POWER MANAGEMENT

POWER MANAGEMENT determines whether or not to switch modes from no signal to the input signal standby mode.

### SIZE

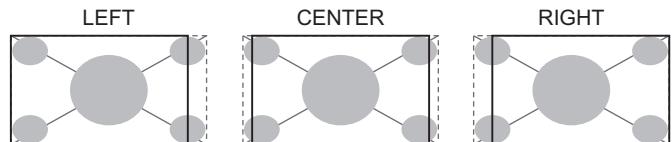
Changes the screen size. (See page 17.)

### 4096 DISPLAY POSITION

Sets the position where the image is displayed (LEFT, CENTER, or RIGHT) when a signal with 4096 horizontal dots is input.

When RIGHT or LEFT is set, a black band may appear in the middle of the screen with some images.

This setting is only valid when the input is HDMI and the screen size is Dot by Dot.



### MUTE AUDIO

Temporarily mutes the sound. The sound is restored when OFF is selected.

\* If using the monitor buttons, hold both [MENU/ENTER] button and [VOL-/▷] button at the same time.

### INFORMATION

Shows information about the monitor.

When HDMI DUAL is set to ON, the signal information of each terminal appears in HDMI1 and HDMI2 fields.

When a button other than [VOL+/◁]/[VOL-/▷] button, brightness adjustment button (△ / ▽) is pressed, or if no action is taken for 15 seconds, the display disappears.

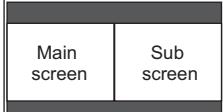
### TIPS

- When WHITE BALANCE is set to THRU, BLACK LEVEL, CONTRAST, TINT, COLORS, RGB INPUT RANGE, GAMMA, PRESET, USER and COPY TO USER cannot be set.
- If COLOR MODE is set to sRGB, the following items cannot be set.  
WHITE BALANCE, PRESET, USER, COPY TO USER, and GAMMA
- When the COLOR MODE is set to VIVID, GAMMA can not be adjusted.

## Menu Items

### ■Dual screen display

Two screens can be displayed by selecting PbyP mode.  
Set this function with "PbyP MODE" in the PbyP menu.

PbyP		A main screen and a sub screen are displayed in a line.
------	---	---

- \* The currently selected input signal is displayed on the main screen.
- \* The following combinations are available for display: (Only when HDMI DUAL is set to OFF.)
  - DisplayPort - HDMI1 or HDMI2
  - HDMI1 - HDMI2

#### TIPS

- You might infringe on a copyright of the author which is protected by copyright law when you display the images of the computer screen and television/VCR simultaneously for profit-making or to show the image to the public.
- The screen size for dual-screen display is the same as the screen size for single-screen display. The Dot by Dot screen is displayed in NORMAL size.
- When dual-screen display is selected, the SCREEN MOTION function is disabled.
- When dual-screen display is selected, the INPUT SELECT options cannot be set.

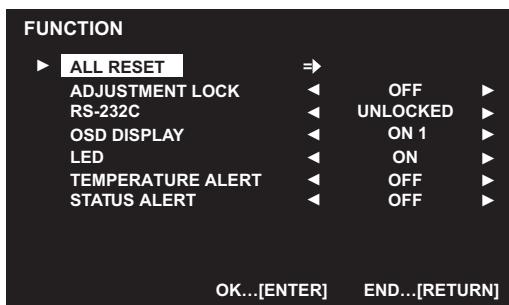
### ■HDMI DUAL

- The HDMI1 and HDMI2 input screens can be displayed as a single screen. The HDMI1 input image will appear on the left and the HDMI2 input image will appear on the right.
- The two HDMI1 and HDMI2 video signals must be output from the same device.
- The screen size can be set.
- The audio setting is the same as the AUDIO SELECT of HDMI1.

# Initialization (Reset)/Functional Restriction Setting (FUNCTION)

You can return the settings to their factory-preset values and restrict operations.

1. Hold down the [MENU/ENTER] button and [INPUT/RETURN] button at the same time until "F" appears in the screen, and then press the [MENU/ENTER] button and [VOL-/▷] button at the same time while "F" appears.



2. Select and set the items.

## ALL RESET

Resets the settings to the factory default settings.  
Select ALL RESET, and then press [MENU/ENTER] button.

After initialization, turn the main power switch off and then back on.

ALL RESET ..... Resets all the settings to the factory default settings.

CANCEL..... Go back without resetting.

## ADJUSTMENT LOCK

You can disable operations on the monitor buttons.

OFF ... Enables operation.

ON 1 .. Disables all operations other than turning power on/off and FUNCTION.

ON 2 .. Only the FUNCTION operation is enabled.

Disables all operations other than FUNCTION (not even power on/off).

## RS-232C

Specifies whether to allow control via RS-232C. (See page 24.)

## OSD DISPLAY

Shows/hides the menu, modes and messages.

The FUNCTION screen cannot be hidden.

ON 1 ..... Shows all menus, modes and messages.

ON 2 ..... Hides messages automatically displayed by the display. Shows messages during operation.

OFF ..... Hides all menus, modes and messages.

## LED

Specifies whether to light the power LED.

## TEMPERATURE ALERT

Selects the notification method for an abnormal temperature.

OFF ..... Do not notify about an abnormal temperature.

OSD & LED .. When an abnormal temperature is detected, the power LED flashes in red and green alternately and the screen displays a message: TEMPERATURE.

LED..... When an abnormal temperature is detected, the power LED flashes in red and green alternately.

## STATUS ALERT

Selects the notification method for a hardware error.

OFF ..... Do not notify about the error.

OSD & LED .. When a hardware error is detected, the power LED flashes in red and the screen displays a message: STATUS [xxxx].

LED..... When a hardware error is detected, the power LED flashes in red.

3. Press [INPUT/RETURN] button to return to the normal screen.

## TIPS

- When both abnormal temperature and hardware error are detected, the hardware error notification overrides.
- If TEMPERATURE ALERT or STATUS ALERT is set to OSD & LED, alert messages will appear even if the OSD DISPLAY is set to ON 2 or OFF.
- If TEMPERATURE ALERT or STATUS ALERT is set to LED or OSD & LED, the LED lights even if the LED function is set to OFF.

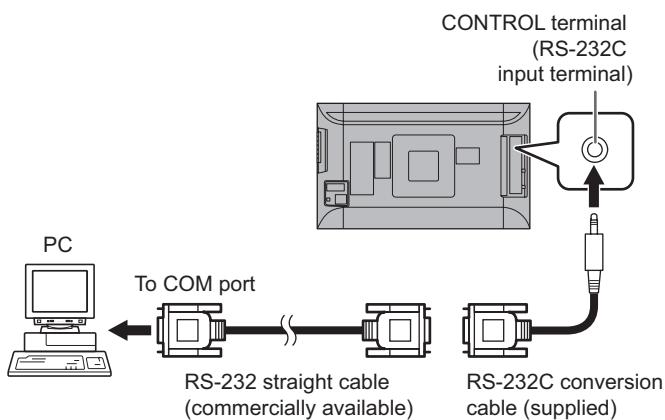
# Controlling the Monitor with a PC (RS-232C)

You can control this monitor from a PC via RS-232C (COM port) on the PC.

## PC connection

Connect the COM port on the PC (RS-232C connector) to the CONTROL terminal (RS-232C input terminal) on the monitor using the RS-232C conversion cable (supplied) and an RS-232 straight cable (commercially available).

Bind the RS-232C conversion cable with the cable clamp.



## Communication conditions

Set the RS-232C communication settings on the PC to match the monitor's communication settings as follows:

Baud rate	*
Data length	8 bits
Parity bit	None

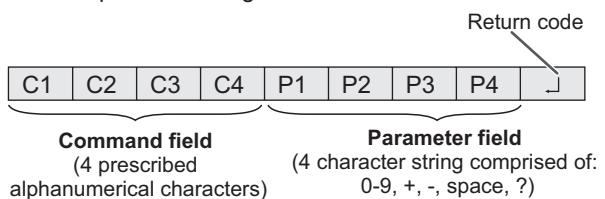
Stop bit	1 bit
Flow control	None

\* Set to the same baud rate as the BAUD RATE setting of SETUP menu. (Initial setting: 38400 bps)

## Communication procedure

### Command format

When a command is sent from the PC to the monitor, the monitor operates according to the received command and sends a response message to the PC.



Example: VOLM0030  
VOLM \\_\\_ 30

- \* Be sure to input 4 characters for the parameter. Pad with spaces ("\\_") if necessary.  
("\\_\\_" is a return code (0DH, 0AH or 0DH))
- Wrong : VOLM30\\_\\_  
Right : VOLM \\_\\_ 30\\_\\_

When inputting a negative value, specify a numerical value in three digits.

Example: OFSR-127

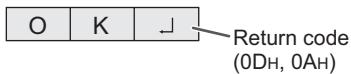
If a command has "R" listed for "Direction" in the "RS-232C command table" on page 26, the current value can be returned by using "?" as the parameter.

Example:

VOLM ? ? ? ? ← From PC to monitor (How much is current volume setting?).  
30 ← From monitor to PC (Current volume setting: 30).

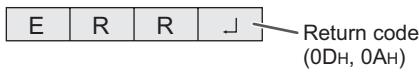
## ■Response code format

When a command has been executed correctly



A response is returned after a command is executed.

When a command has not been executed

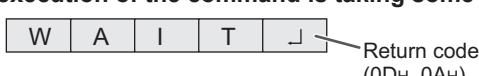


### TIPS

- “ERR” is returned when there is no relevant command or when the command cannot be used in the current state of the monitor.
- If communication has not been established for reasons such as a bad connection between the PC and monitor, nothing is returned (not even ERR).
- “ERR” may be returned when a command cannot be received correctly due to interference from the surrounding environment.

Please ensure that the system or software retries the command if this occurs.

If execution of the command is taking some time



When the following commands are used, “WAIT” is returned. In this case, a value will be returned if you wait a while. Do not send any command during this period.

- Commands which return WAIT:  
When one of the following commands is used:  
RSET, INPS, WIDE, POWR, MWIN, MWIP, DPST

When control via RS-232C is locked (to prevent use) using the operation lock function (See page 23.)



## ■Communication interval

- After OK or ERR is returned, you must send the following commands.  
To set a timeout for the command response, specify 10 seconds or longer.
- Provide an interval of 100 ms or more between the command response and the transmission of the next command.

VOLM0020

OK

Interval of 100 ms or more

INPS0001

WAIT

OK

### TIPS

- When executing ALL RESET, set the timeout period to 30 seconds or longer.

## Controlling the Monitor with a PC (RS-232C)

### RS-232C command table

#### How to read the command table

Command: Command field (See page 24.)  
 Direction: W When the "Parameter" is set in the parameter field (See page 24.), the command functions as described under "Control/Response Contents".  
 R The returned value indicated under "Reply" can be obtained by setting "?????" or "\_\_\_\_?" in the parameter field. (See page 24.)  
 Parameter: Parameter field (See page 24.)  
 Reply: Response (Returned value)  
 \*: "•" indicates a command which can be used in power standby mode.  
 "—" indicates a command which cannot be used in power standby mode.

### Power control/Input mode selection

Function	Command	Direction	Parameter	Reply	Control/Response contents	*
POWER CONTROL	POWR	W	0		Switches to standby mode.	•
			1		Returns from standby mode.	
		R		0	Standby mode	
				1	Normal mode	
				2	Input signal waiting mode	
INPUT MODE SELECTION	INPS	W	0		Toggle change for input mode. Terminals not selected in INPUT SELECT cannot be selected.	•
			9		HDMI1 [AV] "ERR" when PC is selected for HDMI1 of INPUT SELECT.	
			10		HDMI1 [PC] "ERR" when AV is selected for HDMI1 of INPUT SELECT.	
			12		HDMI2 [AV] "ERR" when PC is selected for HDMI2 of INPUT SELECT.	
			13		HDMI2 [PC] "ERR" when AV is selected for HDMI2 of INPUT SELECT.	
			14		DisplayPort	
			15		HDMI DUAL	
		R		9	HDMI1 [AV]	
				10	HDMI1 [PC]	
				12	HDMI2 [AV]	
				13	HDMI2 [PC]	
				14	DisplayPort	
				15	HDMI DUAL	

## Controlling the Monitor with a PC (RS-232C)

### PICTURE menu

Function		Command	Direction	Parameter	Reply	Control/Response contents	*		
BRIGHT		VLMP	WR	0-31	0-31				
CONTRAST		CONT	WR	0-60	0-60				
BLACK LEVEL		BLVL	WR	0-60	0-60		-		
TINT		TINT	WR	0-60	0-60				
COLORS		COLR	WR	0-60	0-60				
SHARPNESS		SHRP	WR	0-24	0-24				
COLOR ADJUSTMENT	COLOR MODE		BMOD	WR	0	0 STD			
					2	2 VIVID			
					3	3 sRGB (When the input mode is PC)			
	WHITE BALANCE	THRU	CTMP	WR	0	0 When the input mode is PC HDMI or DisplayPort.			
		PRESET			1-18	1-18 From 1: approximately 3,000K to 15: approximately 10,000K(500K steps) 16: approximately 5,600K, 17: approximately 9,300K, 18: approximately 3,200K			
		USER			99	99			
		R-CONTRAST	CRTR	WR	0-256	0-256	"ERR" when CTMP is not set to 99.		
		G-CONTRAST	CRTG	WR	0-256	0-256			
		B-CONTRAST	CRTB	WR	0-256	0-256			
COPY TO USER		R-OFFSET	OSRF	WR	-127-127	-127-127			
		G-OFFSET	OSFG	WR	-127-127	-127-127			
		B-OFFSET	OSFB	WR	-127-127	-127-127			
		COPY TO USER	CPTU	W	0	Copies a preset value to the user setting.			
		GAMMA	GAMM	WR	0-2	0-2 0: 1.8, 1: 2.2, 2: 2.4 (during PC input) 0: LIGHT 2, 2: DARK (during AV input)			
					5-6	5: 2.0, 6: STD (during PC input) 5: LIGHT 1, 6: STD (during AV input)			
		C.M.S.-HUE (during AV input)	CMHR	WR	-10-10	-10-10 R Y G C B M			
		CMHY							
		CMHG							
		CMHC							
		CMHB							
		CMHM							
		CRST	W		1	Resets the hue.			
ADVANCED	C.M.S.-SATURATION (during AV input)		WR	-10-10	-10-10	R Y G C B M			
	CMSR								
	CMSY								
	CMSG								
	CMSC								
	CMSB								
	CMSM								
	CRST	W		2	Resets the saturation.				
	CMVR	WR	-10-10	-10-10	R Y G C B M				
	CMVY								
	CMVG								
	CMVC								
	CMVB								
	CMVM								
	CRST	W		3	Resets the brightness.				
	AV HDMI1 RGB INPUT RANGE	AHDR	WR		0-2	0-2 0: AUTO, 1: FULL, 2: LIMITED			
	PC HDMI1 RGB INPUT RANGE	PHDR	WR		0-2	0-2 0: AUTO, 1: FULL, 2: LIMITED			
	AV HDMI2 RGB INPUT RANGE	AH2R	WR		0-2	0-2 0: AUTO, 1: FULL, 2: LIMITED			
	PC HDMI2 RGB INPUT RANGE	PH2R	WR		0-2	0-2 0: AUTO, 1: FULL, 2: LIMITED			
	DisplayPort RGB INPUT RANGE	PDPR	WR		0-2	0-2 0: AUTO, 1: FULL, 2: LIMITED			
RESET		ARST	W		2		-		

## Controlling the Monitor with a PC (RS-232C)

### SETUP menu

Function		Command	Direction	Parameter	Reply	Control/Response contents	*
LANGUAGE	LANG	WR	14	14	14	ENGLISH	
			1	1	1	DEUTSCH	
			2	2	2	FRANÇAIS	
			3	3	3	ITALIANO	
			4	4	4	ESPAÑOL	
			5	5	5	РУССКИЙ	-
			6	6	6	日本語	
INPUT SELECT	HDMI1	HDSL	WR	0-1	0-1	0: PC HDMI, 1: AV HDMI	
	HDMI2	H2SL	WR	0-1	0-1	0: PC HDMI, 1: AV HDMI	-
	HDMI DUAL	HDDU	WR	0-1	0-1	0: OFF, 1: ON	
AUDIO SELECT	HDMI1 [PC]	ASHP	WR	0-1	0-1	0: HDMI, 1: STEREO MINI	
	HDMI1 [AV]	ASHA	WR	0-1	0-1	0: HDMI, 1: STEREO MINI	
	HDMI2 [PC]	AH2P	WR	0-1	0-1	0: HDMI, 1: STEREO MINI	-
	HDMI2 [AV]	AH2A	WR	0-1	0-1	0: HDMI, 1: STEREO MINI	
	DisplayPort	ASDI	WR	1-2	1-2	1: DisplayPort, 2: STEREO MINI	
AUDIO INPUT LEVEL		AIVP	WR	0-1	0-1	0: 1.0Vrms, 1: 0.5Vrms	-
BAUD RATE		BAUD	WR	0-2	0-2	0: 9600bps, 1: 19200bps, 2: 38400bps	-
DisplayPort STREAM		DPST	WR	0-1	0-1	0: SST, 1: MST	-

### MONITOR menu

Function		Command	Direction	Parameter	Reply	Control/Response contents	*
MONITOR	STDR	WR		0-1	0-1	0: LANDSCAPE, 1: PORTRAIT	-
OFF IF NO OPERATION	ATOF	WR		0-1	0-1	0: OFF, 1: ON	-

### PbyP menu

Function		Command	Direction	Parameter	Reply	Control/Response contents	*
PbyP MODE	MWIN	WR		0,2	0,2	0: OFF, 2: ON "ERR" when HDMI DUAL is ON.	-
PbyP SOURCE	MWIP	WR	9	9	9	HDMI1 [AV]	
			10	10	10	HDMI1 [PC]	
			12	12	12	HDMI2 [AV]	-
			13	13	13	HDMI2 [PC]	
			14	14	14	DisplayPort	

### OTHERS menu

Function		Command	Direction	Parameter	Reply	Control/Response contents	*
SCREEN MOTION	PATTERN	SCSV	WR	0,2,3	0,2,3	0: OFF, 2: PATTERN1, 3: PATTERN2	
	MOTION TIME 1	MTIM	WR	0-20	0-20		-
	MOTION TIME 2	MINT	WR	5-20	5-20	Per second	
POWER MANAGEMENT (PC)	PMNG	WR		0-1	0-1	0: OFF, 1: ON	-
POWER MANAGEMENT (AV)	PMAV	WR		0-1	0-1	0: OFF, 1: ON	-
SIZE (PC)	WIDE	WR		1-3	1-3	1: WIDE, 2: NORMAL, 3: Dot by Dot	-
SIZE (AV)	WIDE	WR		1, 4-5	1, 4-5	1: WIDE, 4: NORMAL, 5: Dot by Dot	-
4096 DISPLAY POSITION	4KDP	WR		0-2	0-2	0: LEFT, 1: CENTER, 2: RIGHT	-
MUTE AUDIO	MUTE	WR		0-1	0-1	0: OFF, 1: ON	-
INFORMATION	MODEL	INF1	R		Value		
	SERIAL NO	SRNO	R		Value		●

**Initialization/Functional Restriction Setting (FUNCTION) menu**

Function	Command	Direction	Parameter	Reply	Control/Response contents	*
ALL RESET	RSET	W	0			-
ADJUSTMENT LOCK	ALCK	WR	0-2	0-2	0: OFF, 1:ON 1, 2:ON 2	-
OSD DISPLAY	LOSD	WR	0-2	0-2	0: ON 1, 1: OFF, 2: ON 2	-
LED	OFLD	WR	0-1	0-1	0: ON, 1: OFF	-
TEMPERATURE ALERT	TALT	WR	0-2	0-2	0: OFF, 1: OSD & LED, 2: LED	-
STATUS ALERT	SALT	WR	0-2	0-2	0: OFF, 1: OSD & LED, 2: LED	-

**Others**

Function	Command	Direction	Parameter	Reply	Control/Response contents	*
VOLUME	VOLM	WR	0-31	0-31		-
BRIGHT	VLMP	WR	0-31	0-31		-
TEMPERATURE SENSOR	DSTA	R		0	Internal temperature normal	
				1	Internal temperature abnormal has occurred and the monitor is in standby mode	
				2	Internal temperature abnormal occurred (To delete the information of temperature abnormal, turn off the main power.)	●
				3	Internal temperature abnormal has occurred and backlight brightness is dimmed	
				4	Temperature sensor abnormal	
TEMPERATURE ACQUISITION	ERRT	R		Value	Returns the temperature of the temperature sensor. Indicates a temperature sensor abnormality when "126" is returned.	-
CAUSE OF LAST STANDBY MODE	STCA	W	0		Initialization	
				0	No detectable error has occurred	
		R		1	Standby mode by POWER button	
				2	Main power off by the main power switch	
				3	Standby mode by RS-232C	
				4	Input signal waiting mode by No Signal	
				6	Standby mode by abnormal temperature	
				20	Standby mode by OFF IF NO OPERATION setting	

# Troubleshooting

If you are experiencing any problem with your display, before calling for service, please review the following troubleshooting tips.

## There is no picture or sound.

- Are the AC adapter and power cord properly connected? (See page 13.)
- Is the main power switch off? (See page 15.)
- Is the monitor in standby mode (power lamp is off)? (See page 15.)
- Make sure correct input mode is selected. (See page 16.)
- If any external equipment is connected, make sure the equipment is operating (playing back).

## Sound from left and right speakers is reversed.

## Sound is heard from only one side.

- Are audio cables connected properly? (See page 12.)

## There is a picture but no sound.

- Is the sound muted?
- Make sure the volume is not set to minimum.
- Are audio cables connected properly?
- Is the setting of AUDIO SELECT on the SETUP menu correct? (See page 20.)
- Is the headphone (etc.) cable connected to the headphone terminal?

## The sound crackles.

- Turn down the volume.  
With some input devices, the sound may crackle at high volume.

## Unstable video.

- The signal may be incompatible.

## The video from the PC/AV HDMI input terminal does not appear properly.

- Is the HDMI or HDMI DUAL setting correct in INPUT SELECT on the SETUP menu? (See page 20.)
- Is the HDMI cable HDMI standard compliant? The monitor will not work with cables that are not standard compliant.
- Is the input signal compatible with this monitor? (See pages 33 to 34.)

## The video from DisplayPort input terminal does not appear properly.

- Is the cable a certified DisplayPort cable? Use the supplied cable. The monitor will not work unless a standards-compliant cable is used.
- Is the input signal compatible with this monitor? (See page 33.)

## The video does not appear properly even after the DisplayPort STREAM setting is changed.

- Try restarting the monitor and computer.
- Is the video card MST (Multi Stream) compatible? If not, set to SST (Single Stream).

## Control buttons do not work.

### There is no picture.

- Load noises from outside may be interfering with normal operation. Turn off the power and turn it on after waiting at least 5 seconds, and then check the operation.
- When you display the screen or clear the screen, the left and right screen display timing may be slightly off; however, this is not a problem.

### Power LED flashes red.

#### "STATUS [xxxx]" appears in the corner of the screen.

- Hardware has a problem. Turn off the monitor and request repair from your SHARP dealer.  
(When STATUS ALERT is set to OSD & LED. This varies depending on the setting.)

### When "AUTO DIMMING" is displayed.

- When the internal temperature of the monitor rises excessively, the brightness of the backlight automatically decreases in order to prevent a further temperature rise.  
If you attempt to use brightness adjustment button ( $\triangle$  /  $\nabla$ ) to adjust the brightness while the monitor is in this state, "AUTO DIMMING" is displayed and you cannot change the brightness.
- Remove the cause of the excessive temperature rise.

### The monitor makes a cracking sound.

- You may occasionally hear a cracking sound from the monitor. This happens when the cabinet slightly expands and contracts according to change in temperature. This does not affect the monitor's performance.

### The Power LED is flashing in red and green alternately.

#### When "TEMPERATURE" is displayed in the corner of the screen.

- When the internal temperature of the monitor rises excessively, the brightness of the backlight decreases automatically in order to prevent high-temperature-related problems. When this occurs, "TEMPERATURE" is displayed on the screen and the Power LED flashes red and green alternately. (When TEMPERATURE ALERT is set to OSD & LED. This varies depending on the setting.)
- If the internal temperature rises further, the monitor automatically enters standby mode. (The Power LED continues flashing red and green alternately.)
- Remove the cause of the excessive temperature rise.
  - If the monitor enters standby mode due to a rise in temperature, to return to normal display, turn the power switch off and then back on again. The monitor, however, will enter standby mode again if the cause of the temperature rise is not eliminated. (See page 7.)
  - Check whether the monitor is placed at a location where a quick rise in temperature is likely. Internal temperature rises quickly if the vents on the monitor are blocked.
  - Internal temperature rises quickly if dust accumulates inside the monitor or around the vents. Remove dust if possible. Ask SHARP dealer about removing internal dust.

### A residual image has occurred.

#### After the image has changed, the previous image is faintly visible.

- Displaying the same image for an extended time may cause a residual image.
- To improve a residual image, keep the power off. With the power off state, the residual image will gradually disappear as time passes. If there is no improvement, display a full white screen or an animated image.

# Specifications

## ■Product Specifications

Model	PN-K321	
LCD component	32" Class [31-35/64 inch (80.1cm) diagonal] TFT LCD	
Max. resolution (pixels)	3840 x 2160	
Max. colors	Approx. 1.07 billion colors	
Pixel pitch	0.182 mm (H) × 0.182 mm (V)	
Viewing angle	176° right/left/up/down (contrast ratio ≥ 10)	
Screen active area inch (mm)	27-31/64 x 15-15/32 (697.9 x 392.6)	
Response speed	8 ms (Gray to Gray, avg.)	
Plug and play	VESA DDC2B	
Power management	VESA DisplayPort	
Input terminals	PC/AV	HDMI x 2
	PC	DisplayPort x 1
	Audio	3.5 mm mini stereo jack x 1
	Serial (RS-232C)	3.5 mm mini jack x 1
Output terminals	Audio	3.5 mm mini stereo jack x 1
Speaker output	2 W + 2 W	
Power requirement	AC 100 V - 240 V, 50/60 Hz (when using the supplied AC adapter)	
Operating temperature	32°F to 104°F (0°C to 40°C)	
Operating humidity	20% to 80% (no condensation)	
Power consumption (input signal waiting mode / standby mode)	93 W * (1.2 W / 0.7 W) (when using the supplied AC adapter)	
Dimensions (excluding protrusions) inch (mm)	Approx. 29-17/32(W) x 1-25/64(D) x 17-3/8(H) (750 x 35 x 441) (monitor only)	
	Approx. 29-17/32(W) x 10-3/32(D) x 19-17/64~24-31/32(H) (750 x 256 x 489~634) (monitor on supplied stand)	
Weight lbs. (kg)	Approx. 16.5 (7.5) (monitor only)	
	Approx. 28.7 (13.0) (monitor on supplied stand)	

\* When using the monitor in DC19.5 V : 87 W

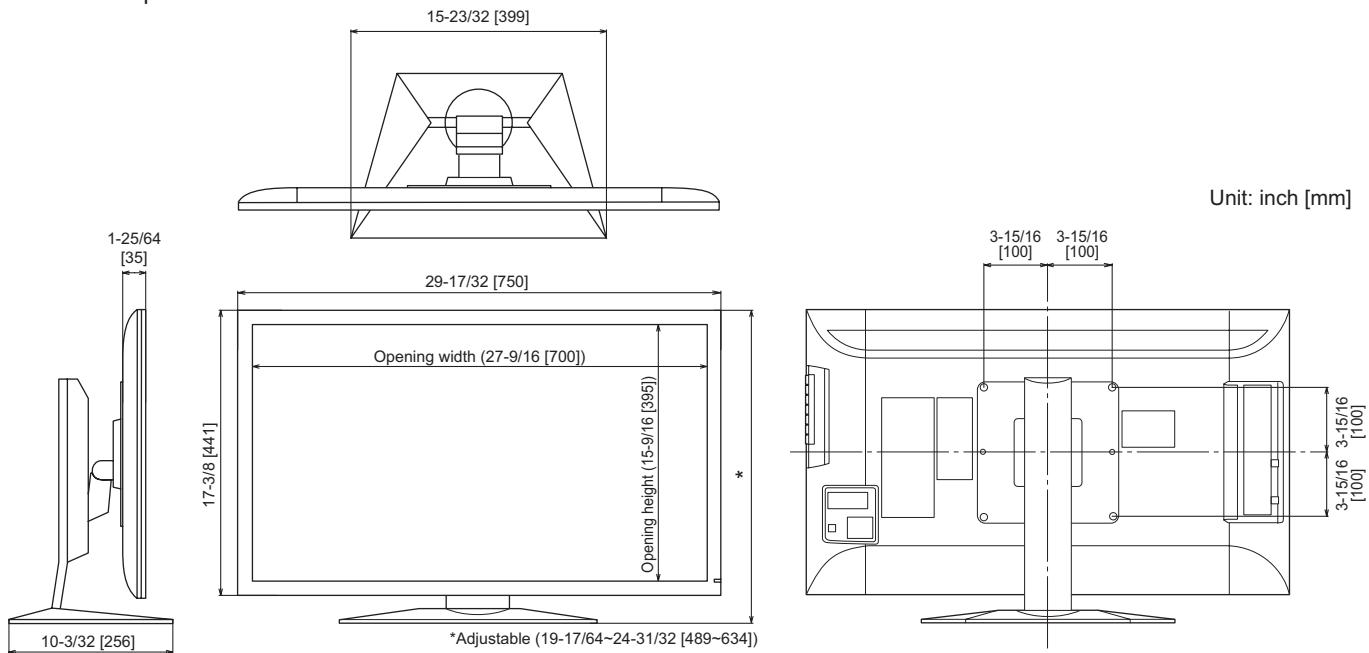
As a part of our policy of continuous improvement, SHARP reserves the right to make design and specification changes for product improvement without prior notice. The performance specification figures indicated are nominal values of production units. There may be some deviations from these values in individual units.

## Specifications

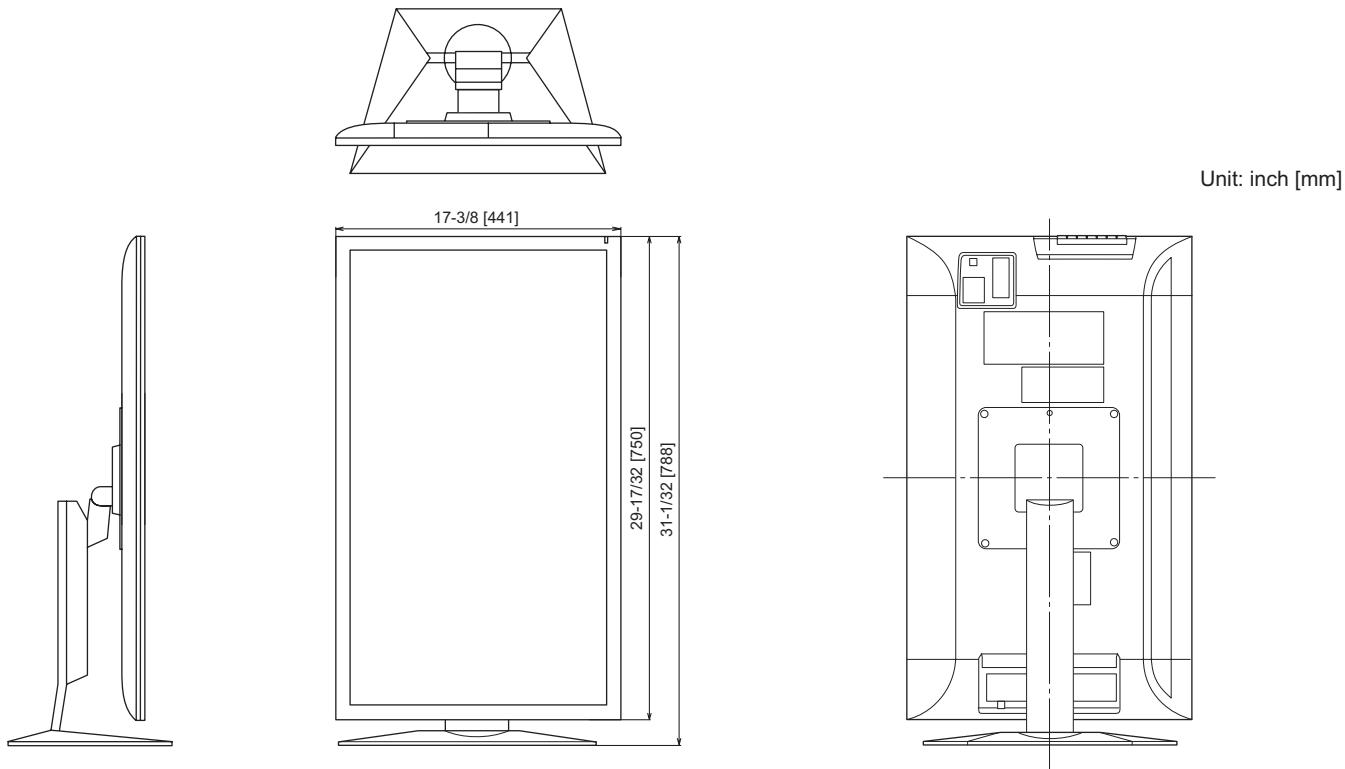
### ■ Dimensional Drawings

Note that the values shown are approximate values.

- Landscape



- Portrait



When mounting the monitor, be sure to use a wall-mount bracket that complies with the VESA-compatible mounting method. SHARP recommends using M6 screws and tighten the screws.

Note that screw hole depth of the monitor is 3/8 inch (10 mm). Loose mounting may cause the product to fall, resulting in serious personal injuries as well as damage to the product. The screw and hole should come together with over 5/16 inch (8 mm) length of thread. Use a bracket which has been approved for UL1678 standard, and which can endure at least 4 times or more the weight of the monitor.

## ■Compatible signal timing (PC)

Screen resolution		Vsync	DisplayPort	HDMI1 or HDMI2	HDMI DUAL <sup>*1</sup>
VESA	640×480	60Hz	Yes	Yes	-
		72Hz	Yes	Yes	-
	800×600	75Hz	Yes	Yes	-
		56Hz	Yes	Yes	-
		60Hz	Yes	Yes	-
		72Hz	Yes	Yes	-
		75Hz	Yes	Yes	-
	848×480	60Hz	Yes	Yes	-
	1024×768	60Hz	Yes	Yes	-
		70Hz	Yes	Yes	-
		75Hz	Yes	Yes	-
	1152×864	75Hz	Yes	Yes	-
	1280×768	60Hz	Yes	Yes	-
		75Hz	Yes	Yes	-
	1280×800	60Hz	Yes	Yes	-
	1280×960	60Hz	Yes	Yes	-
	1280×1024	60Hz	Yes	Yes	-
		75Hz	Yes	Yes	-
	1360×768	60Hz	Yes	Yes	-
	1400×1050	60Hz	Yes	Yes	-
	1600×1200	60Hz	Yes	Yes	-
	1680×1050	60Hz	Yes	Yes	-
	1920×1200	60Hz	Yes	-	-
3840×2160	24Hz	Yes	Yes	Yes <sup>*4</sup>	
	25Hz	Yes	Yes	-	
	30Hz	Yes	Yes	Yes <sup>*4</sup>	
	50Hz	Yes <sup>*3*6</sup>	-	Yes <sup>*4</sup>	
	60Hz	Yes <sup>*3*6</sup>	-	Yes <sup>*4</sup>	
Wide	4096×2160 <sup>*2</sup>	24Hz	-	Yes	Yes <sup>*5</sup>
	1280×720	60Hz	Yes	Yes	-
US TEXT	1920×1080	60Hz	Yes	Yes	-
	720×400	70Hz	Yes	Yes	-

\*1 A single screen is created from simultaneous input of two systems using HDMI1 and HDMI2.

\*2 Displays a reduced image, except in Dot by Dot. In Dot by Dot, the image will be cut down to panel size then displayed.

\*3 Displays using multi-streaming.

\*4 The two HDMI input terminals both have 1920 x 2160 signals.

\*5 The two HDMI input terminals both have 2048 x 2160 signals.

\*6 The signals for the left and right screens are both 1920 x 2160 signals.

\* All are compliant only with non-interlaced.

\* Depending on the connected PC, images may not be displayed properly even if the compatible signal described above is input.

## Specifications

### ■Compatible signal timing (AV)

Screen resolution	Frequency	HDMI
1920 × 1080p	24Hz	Yes
	50Hz	Yes
	59.94Hz	Yes
	60Hz	Yes
1920 × 1080i	50Hz	Yes
	59.94Hz	Yes
	60Hz	Yes
1280 × 720p	50Hz	Yes
	59.94Hz	Yes
	60Hz	Yes
720 × 576p	50Hz	Yes
720 × 480p	59.94Hz	Yes
	60Hz	Yes
640 × 480p(VGA)	59.94Hz	Yes
	60Hz	Yes
720(1440) × 576i	50Hz	Yes
720(1440) × 480i	59.94Hz	Yes
	60Hz	Yes

### ■Power management

This monitor conforms to VESA DisplayPort power management.

### ■DDC (plug and play)

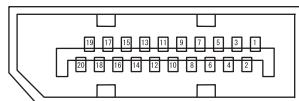
The monitor supports the VESA DDC (Display Data Channel) standard.

DDC is a signal standard for plug and play between monitors and computers. Information about resolution and other parameters is exchanged between the two. This function can be used if the computer supports DDC and it has been configured to detect plug-and-play monitors.

There are several types of DDC, depending on the communication method used. This monitor supports DDC2B.

**■DisplayPort input terminal pins**

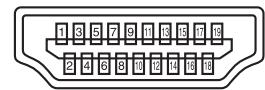
(DisplayPort 20 pin)



No.	Function	No.	Function
1	MainLane 3-	11	Gnd
2	Gnd	12	MainLane 0+
3	MainLane 3+	13	Gnd
4	MainLane 2-	14	Gnd
5	Gnd	15	Aux+
6	MainLane 2+	16	Gnd
7	MainLane 1-	17	Aux-
8	Gnd	18	Hot-plug detection
9	MainLane 1+	19	Gnd
10	MainLane 0-	20	3.3V

**■PC/AV HDMI input terminal pins**

(HDMI™ Connector)



No.	Function	No.	Function
1	TMDS data 2+	11	TMDS clock shield
2	TMDS data 2 shield	12	TMDS clock-
3	TMDS data 2-	13	CEC
4	TMDS data 1+	14	N.C.
5	TMDS data 1 shield	15	SCL
6	TMDS data 1-	16	SDA
7	TMDS data 0+	17	DDC/CEC GND
8	TMDS data 0 shield	18	+5V
9	TMDS data 0-	19	Hot-plug detection
10	TMDS clock+		

# Mounting Precautions (For SHARP dealers and service engineers)

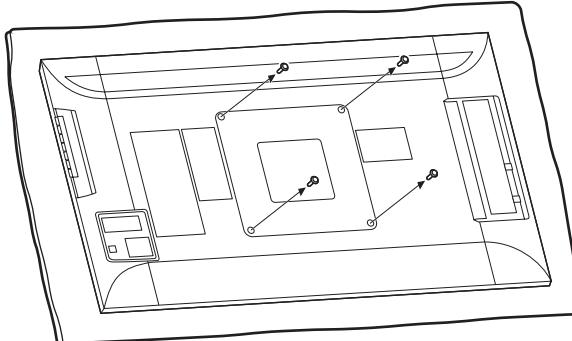
- When installing, removing or moving the monitor, ensure that this is carried out by at least 2 people.
- Be sure to use a wall-mount bracket designed or designated for mounting the monitor.
- This monitor is designed to be installed on a concrete wall or pillar. Reinforced work might be necessary for some materials such as plaster / thin plastic board / wood before starting installation.  
This monitor and bracket must be installed on a wall which can endure at least 4 times or more the weight of the monitor. Install by the most suitable method for the material and the structure.
- To attach a VESA-compliant mounting bracket, use M6 screws that are 5/16 inch (8 mm) to 3/8 inch (10 mm) longer than the thickness of the mounting bracket.
- Do not use an impact driver.
- When moving the monitor, be sure to hold it with the unit bottom and the side of unit. Do not hold the LCD panel or corners. This may cause product damage, failure, or injury.
- Do not use any screw holes other than VESA holes for installation.

## ■ Removing the attachment plate

### ! Caution

- The attachment plate is only for use with the monitor. Do not use with any other devices.

- Spread a thick, soft cloth (blanket, etc.) that will prevent damage to the LCD panel on a stable flat surface where the entire monitor can be placed, and place the monitor with the LCD panel face down on the cloth.
- Remove the screws(x4) that fasten the attachment plate, and remove the attachment plate.



## ■ Toppling prevention

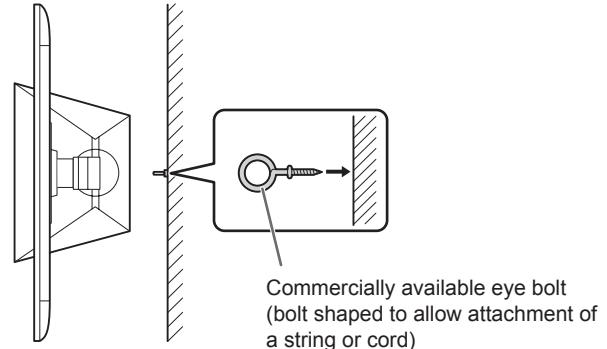
### ! Caution

- To reduce the risk of injury and damage caused by the product toppling or falling in an earthquake or similar situation, take measures to prevent toppling and falling.
- If the wall or platform on which the monitor is installed is not sufficiently strong, the effectiveness of the toppling/falling prevention measures will be severely compromised. Reinforce the wall or platform as needed.  
The toppling/falling prevention measures are intended to reduce the risk of injury and damage in an earthquake, however, the effectiveness of the measures is not guaranteed in all earthquakes.
- Before implementing the toppling prevention measures, complete all connections.

### Secure to wall or post

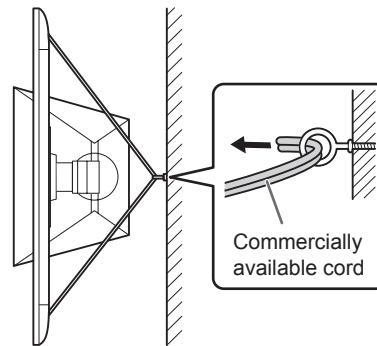
- Attach a commercially available eye bolt (a bolt shaped to allow attachment of a string or cord) to the wall or post.  
Verify that the eye bolt is attached firmly and does not come out.

#### • Top of monitor

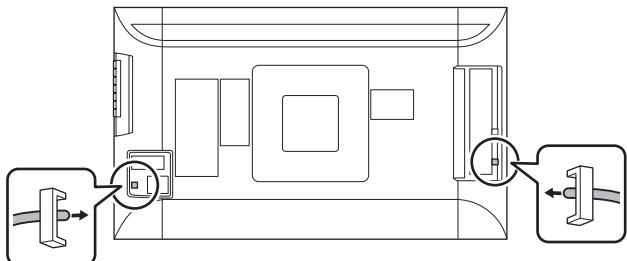


- Run a commercially available cord of sufficient strength through the cable clamp attachments and the eye of the eye bolt on the wall or post to secure the monitor.

#### • Top of monitor



#### • Back of monitor



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